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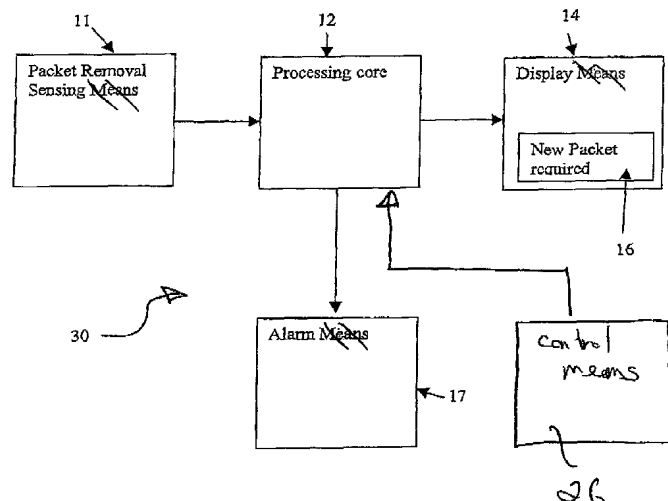
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(54) Title: AN ELECTRONIC PILL PACKET HOLDER AND REMINDER THAT DETECTS PILL PACKET REMOVAL



(57) Abstract: A monitor for use in association with a pill or medicament dose dispenser or packet; said pill or medicament dose dispenser or packet of the type adapted to releasably retain one or more pills or like medicament doses; said monitor comprising: (a) a dispenser or packet presence sensing means; (b) alarm means; (c) timing means; (d) logic means; said logic means adapted to cause said alarm means to issue an alarm signal if said dispenser or packet presence sensing means detects the presence of a dispenser or packet for a continuous period of time determined by said timing means greater than a preset period of time; said present period of time being a function of the content of said one or more pills or like medicament doses. In a further form there is disclosed a pill packet holder adapted for housing a container or packet of pills or like medicament doses; said holder incorporating a sensor which detects a packet movement condition.



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**AN ELECTRONIC PILL PACKET HOLDER AND REMINDER THAT DETECTS
PILL PACKET REMOVAL**

The present invention relates to an electronic device
5 for containing pill packets, allowing the user to pre-
program reminder times as to when these pills are to be
taken, and more particularly to a device has knowledge as
to whether or not the packet has been removed during those
times by a sensing means.

10

BACKGROUND

The invention relates to the art of devices for
containing and alarming as to the dispensing time of pills,
either non prescription or prescription.

15 It is an object of the present invention to detect
that a pill packet has been removed from a dispenser
through a sensing means and to use this information to
provide a reminder.

20 **BRIEF DESCRIPTION OF INVENTION**

Accordingly, in one broad form of the invention there
is provided a monitor for use in association with a pill or
medicament dose dispenser or packet; said pill or
medicament dose dispenser or packet of the type adapted to
25 releasably retain one or more pills or like medicament
doses; said monitor comprising:

- (a) a dispenser or packet presence sensing means;
- (b) alarm means;
- (c) timing means;
- 30 (d) logic means;

said logic means adapted to cause said alarm means to issue
an alarm signal if said dispenser or packet presence
sensing means detects the presence of a dispenser or packet
for a continuous period of time determined by said timing

means greater than a preset period of time; said preset period of time being a function of the content of said one or more pills or like medicament doses.

Preferably said logic means and said timing means are
5 implemented by way of a microprocessor.

Preferably said alarm means comprises an audible alarm.

Preferably said dispenser or packet presence sensing means comprises a mechanical switch in electrical
10 communication with said logic means.

Preferably said dispenser or packet presence sensing means comprises an optical sensor.

In a further broad form of the invention there is provided a method of monitoring timely administration of
15 pills or like medicament doses; said method comprising providing a sensor associated with a medicament dose dispenser or packet; said medicament dose dispenser or packet of the type adapted to releasably retain one or more pills or like medicament doses; said sensor adapted to
20 detect when said dispenser or packet is displaced; said method further comprising issuing an alarm in the event that said dispenser or packet is not displaced for a continuous period of time greater than a preset period of time; said preset period of time being a function of the
25 content of said pills or like medicament doses.

In yet a further broad form of the invention there is provided a monitor for use in association with a pill or medicament dose dispenser or packet; said monitor operable in accordance with the flowchart of Fig. 3

30 In yet a further broad form of the invention there is provided a method of monitoring timely ingestion of pills or medicament doses; said method comprising operating dispenser or packet presence sensing means, alarm means,

timing means and logic means generally in accordance with the flowchart of Fig. 3.

In a further broad form of the invention there is provided a pill packet holder adapted for housing a container or packet of pills or like medicament doses; said holder incorporating a sensor which detects a packet movement condition.

Preferably a packet movement condition comprises said container or packet being removed from said housing.

10 Preferably said packet movement condition comprises insertion of said container or packet into said housing.

Preferably said holder further incorporates logic which monitors time elapsed between a first event and detection of said packet movement condition.

15 Preferably said holder communicates an alarm condition if said time elapsed is equal to or greater than a predetermined period of time.

Preferably said first event comprises expiry of a predetermined initial time period.

20 Preferably said predetermined initial time period is initiated by a user pressing a button.

BRIEF DESCRIPTION OF DRAWINGS

The present invention is now described, with reference to the accompanying drawings, wherein:

Fig. 1 is a block diagram of device functionality of a monitor in accordance with a first preferred embodiment; and

Fig. 2 illustrates a circuit diagram suitable to implement the monitor of Fig. 1;

Fig. 3 illustrates a preferred software flow chart for operation of the monitor of Fig. 1;

Fig. 4 illustrates a housing suitable for the monitor of Fig. 1;

Fig. 5 is a block diagram of a electronic components forming part of a pill packet holder according to a third embodiment of the present invention;

Fig. 6 is an electronic circuit diagram of the components of the pill packet holder of Fig. 5;

Fig. 7 is a logic_flow diagram executable by the components of Fig. 5.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

In accordance with one aspect of the present invention, there is disclosed a pill reminding device which holds pill packets. The device contains electronic hardware and software such that specific reminder times can be programmed into the device by the user. An electronic sensing means such as an electro-optical or electronic switch detects whether or not the pill packet was removed after the alarm is activated at the specified times. The alarm is deactivated when the packet is replaced in preparation for the next scheduled pill dispensing time.

The drawings illustrate a monitor system of the invention in various preferred embodiments. Figures 2 illustrates the electronics of a monitor system 30 used in a first preferred embodiment. With reference to figs 1, 2, 3, 4 an electronic sensing means 11 either optical magnetic or contact switch is used to sense the presence of the pill packet 1. A central processing unit 12 stores the time and the day set by the user as well as reminder times for each day of the week which are also set by the user. When the set time and day reaches the set reminder time and day an alarm sequence is begun until the pill packet 1 (refer Fig. 4) is detected as to have been removed. Alarm means 17 indicates to a user (not shown) that the packet 1 has not been removed. Replacement of the pill packet 1 turns off the alarm sequence until the time and day reaches the next

reminder day and time and so forth. In the preferred embodiment 21 or 28 day cycles can be set. In the 21 day cycle mode the alarm will not sound for the last 7 days of a 28 day cycle. This embodiment is particularly useful for
5 contraceptive pills. The times and days are set by the user via a display unit 14 and push button switches 15. In both modes the end of the 28 day cycle is indicated by a new packet indicator 16. If in the event that the packet 1 is left removed or not removed at the set reminder times the
10 alarm sequence will always be active. With reference to the first preferred embodiment of fig 4, the embodiment shows that the packet 1 is placed into housing 2.

First embodiment

15 In the first embodiment with particular reference to fig. 4, housing 2 can have a clear base enabling the pill packet 1 to be viewed by the user. This enables the user to see whether pills have been removed. The processor 12 communicates with a display unit 14. Times, days and
20 reminder times and days and cycle setting are programmed by using the push buttons 15. With reference to Fig. 2 the power supply means, in this case batteries 8 are shown. The packet removal sensor 11 is also shown as is the display unit (LCD 14).

25

Second embodiment

In a second preferred embodiment with reference to fig. 4, a wall attachment means such as hook 20 allows housing 2 to be secured to a support means such as wall 21
30 or a bench).

Third Embodiment

With reference to Figs. 5, 6 and 7 a third embodiment is illustrated where like components are numbered as for

the first embodiment. It is similar to embodiment one with the exception that the display is removed and 2 button of 3 is removed. This embodiment contains no display means and only a single push button 27 to set a 24 hour reminder
5 period together with alarm, packet detection switch, microprocessor and support electronics and battery supply.

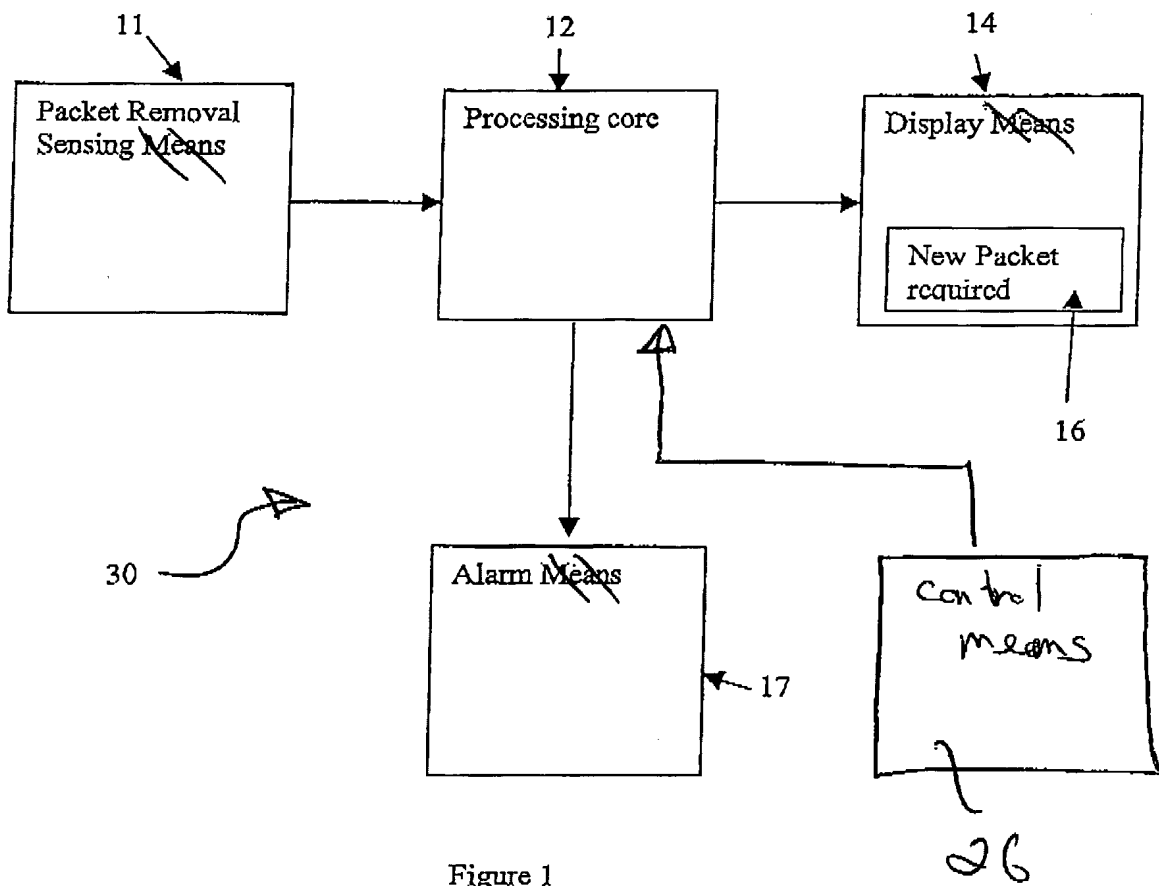
The above describes only some embodiments of the present invention and modifications, obvious to those
10 skilled in the art, can be made thereto without departing from the scope and spirit of the present invention.

CLAIMS

1. A monitor for use in association with a pill or medicament dose dispenser or packet; said pill or medicament dose dispenser or packet of the type adapted to releasably retain one or more pills or like medicament doses; said monitor comprising:
 - (a) a dispenser or packet presence sensing means;
 - (b) alarm means;
 - (c) timing means;
 - 10 (d) logic means;said logic means adapted to cause said alarm means to issue an alarm signal if said dispenser or packet presence sensing means detects the presence of a dispenser or packet for a continuous period of time determined by said timing means greater than a preset period of time; said preset period of time being a function of the content of said one or more pills or like medicament doses.
- 15 2. The monitor of Claim 1 wherein said logic means and said timing means are implemented by way of a microprocessor.
3. The monitor of Claim 1 or Claim 2 wherein said alarm means comprises an audible alarm.
- 25 4. The monitor of any previous claim wherein said dispenser or packet presence sensing means comprises a mechanical switch in electrical communication with said logic means.
- 30 5. The monitor of any previous claim wherein said dispenser or packet presence means comprises an optical sensor.

6. A method of monitoring timely administration of pills or like medicament doses; said method comprising providing a sensor associated with a medicament dose dispenser or packet; said medicament dose dispenser or packet of the type adapted to releasably retain one or more pills or like medicament doses; said sensor adapted to detect when said dispenser or packet is displaced; said method further comprising issuing an alarm in the event that said dispenser or packet is not displaced for a continuous period of time greater than a preset period of time; said preset period of time being a function of the content of said pills or like medicament doses.
7. A monitor for use in association with a pill or medicament dose dispenser or packet; said monitor operable in accordance with the flowchart of Fig. 3
8. A method of monitoring timely ingestion of pills or medicament doses; said method comprising operating dispenser or packet presence sensing means, alarm means, timing means and logic means generally in accordance with the flowchart of Fig. 3.
9. A pill packet holder adapted for housing a container or packet of pills or like medicament doses; said holder incorporating a sensor which detects a packet movement condition.
10. The holder of Claim 9 wherein a packet movement condition comprises said container or packet being removed from said housing.

11. The holder of Claim 9 or 10 wherein said packet movement condition comprises insertion of said container or packet into said housing.
- 5 12. The holder of Claim 9, 10 or 11 wherein said holder further incorporates logic which monitors time elapsed between a first event and detection of said packet movement condition.
- 10 13. The holder of Claim 12 wherein said holder communicates an alarm condition if said time elapsed is equal to or greater than a predetermined period of time.
- 15 14. The holder of Claim 12 or 13 wherein said first event comprises expiry of a predetermined initial time period.
- 20 15. The holder of any one of Claims 12 to 14 wherein said predetermined initial time period is initiated by a user pressing a button.



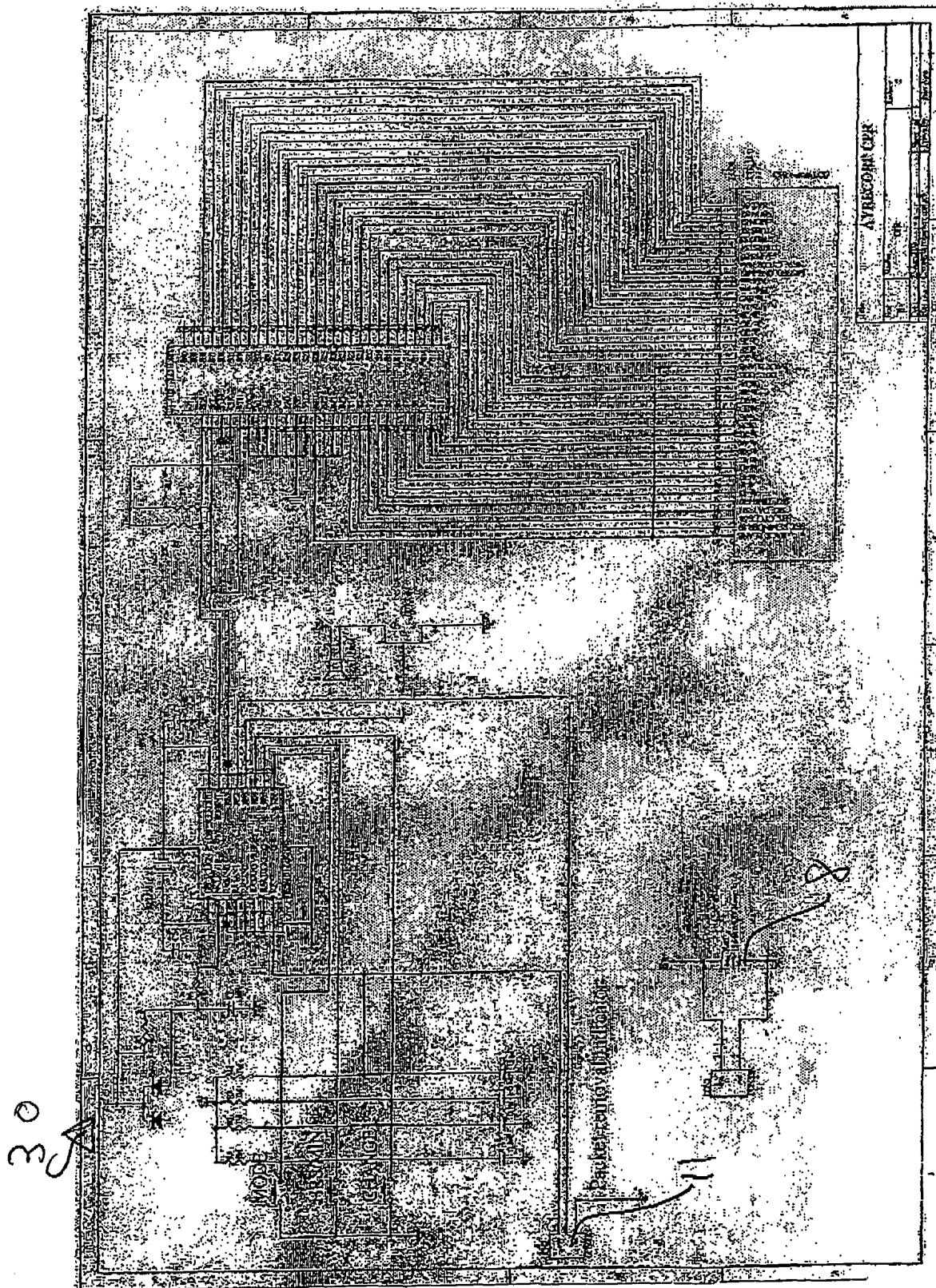


Figure 2

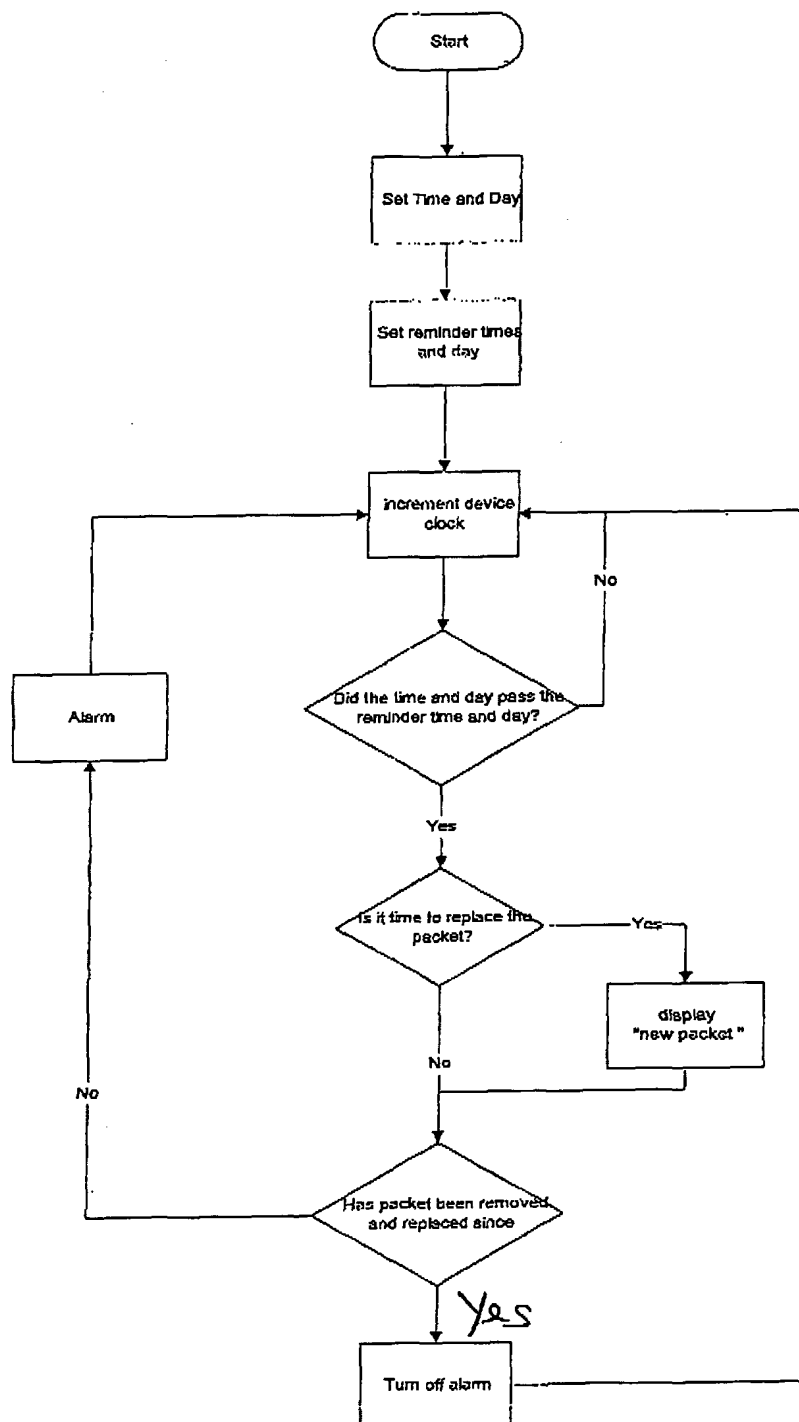


Figure 3

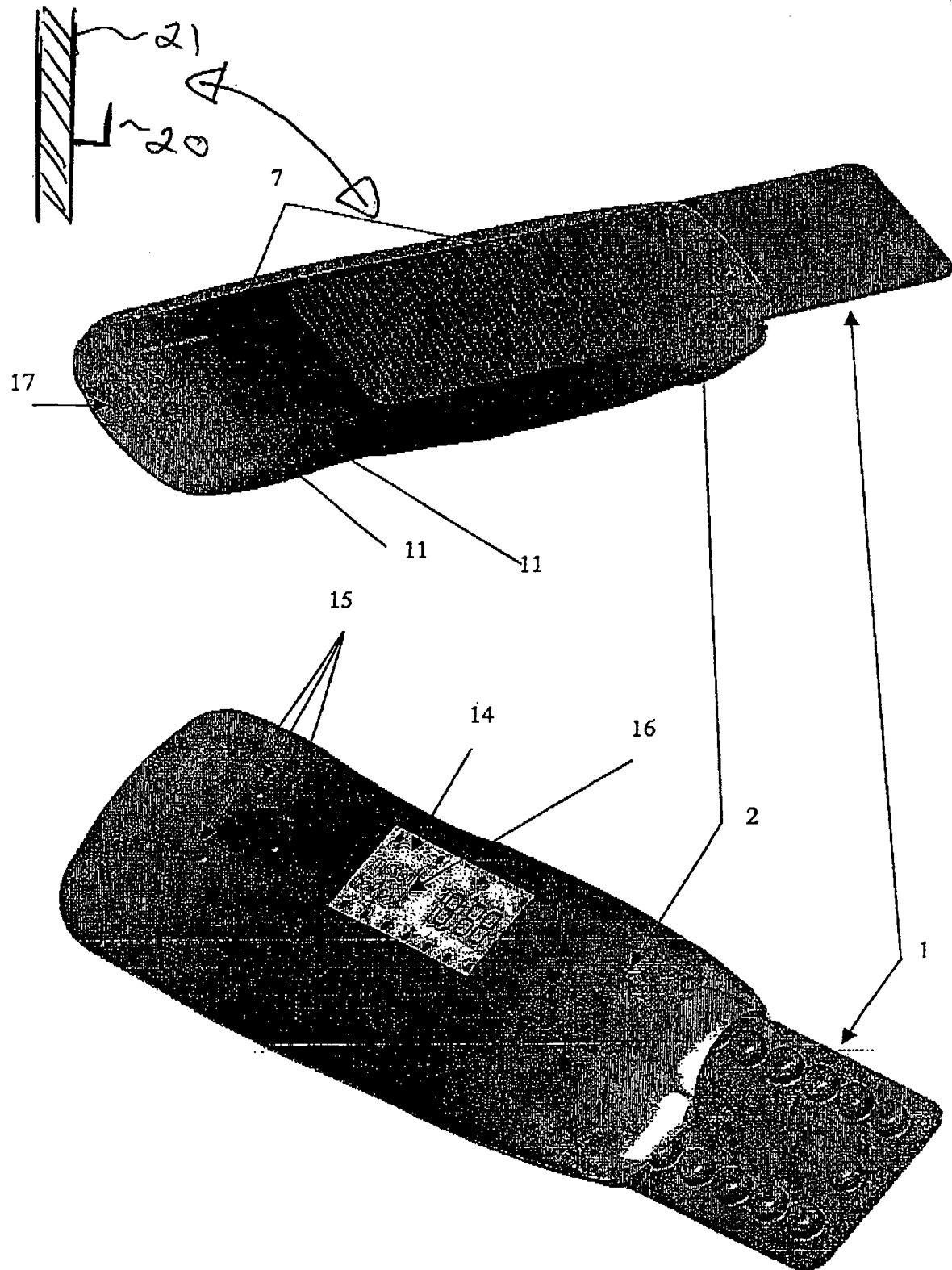


Fig 4

Third embodiment

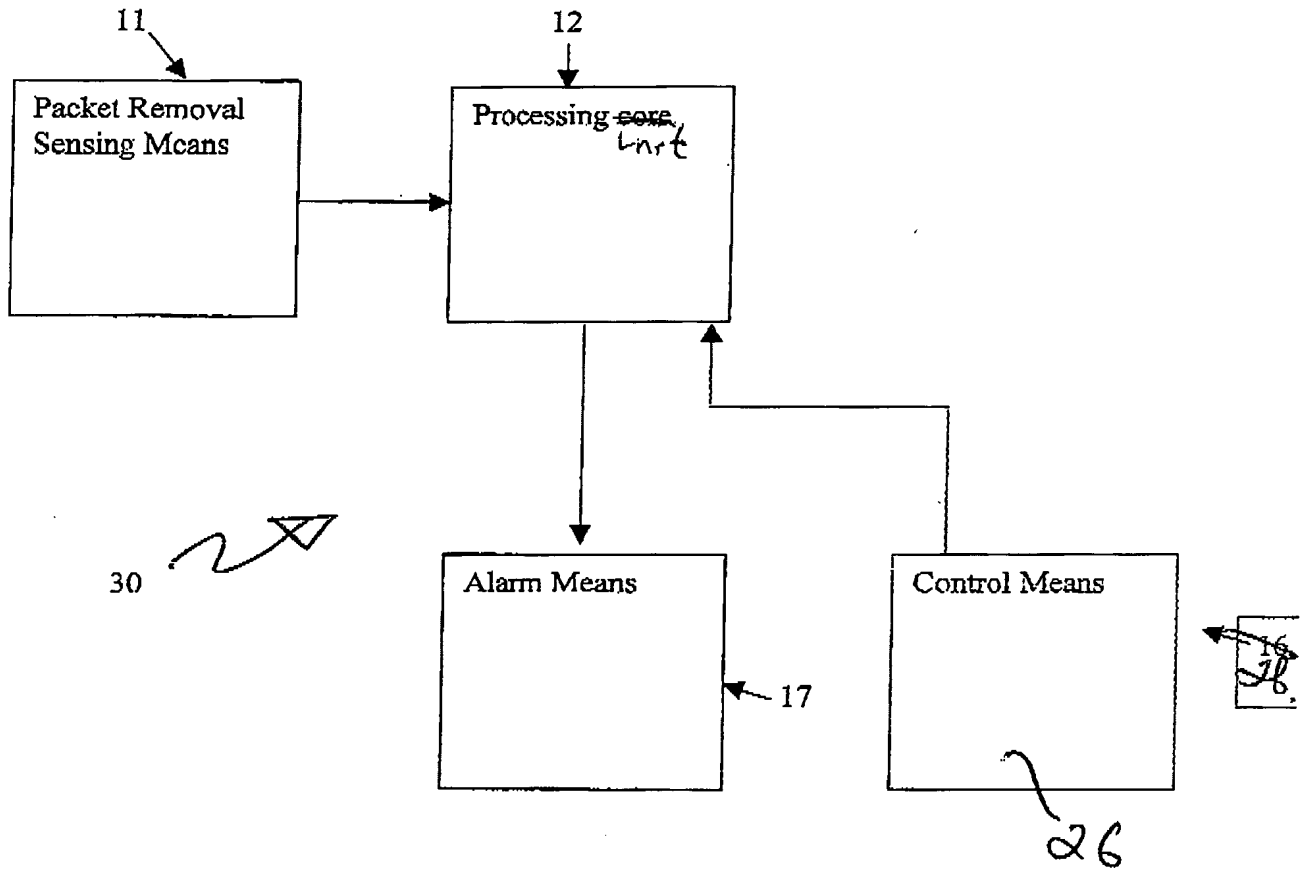


Figure 5

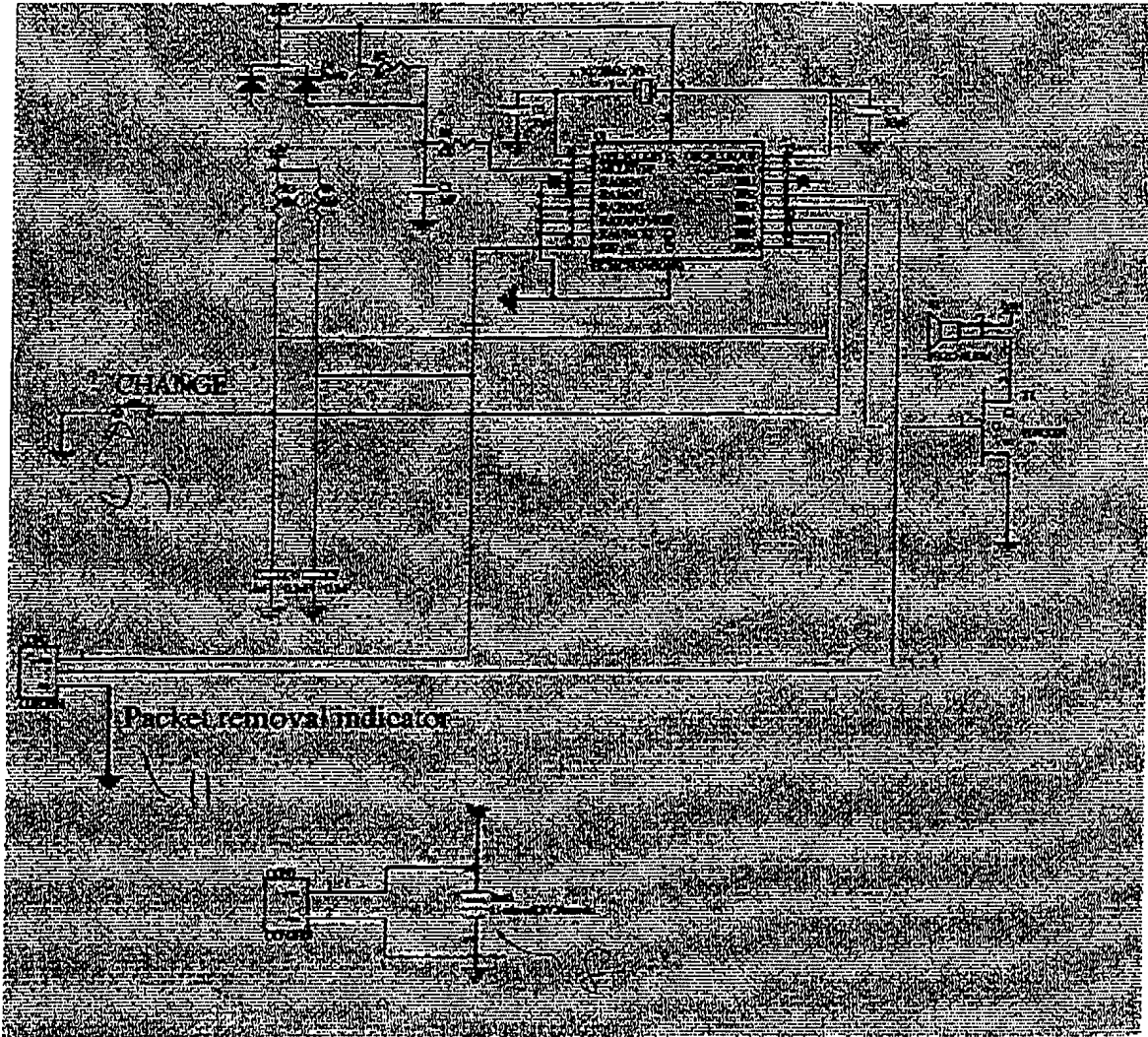


Figure 6

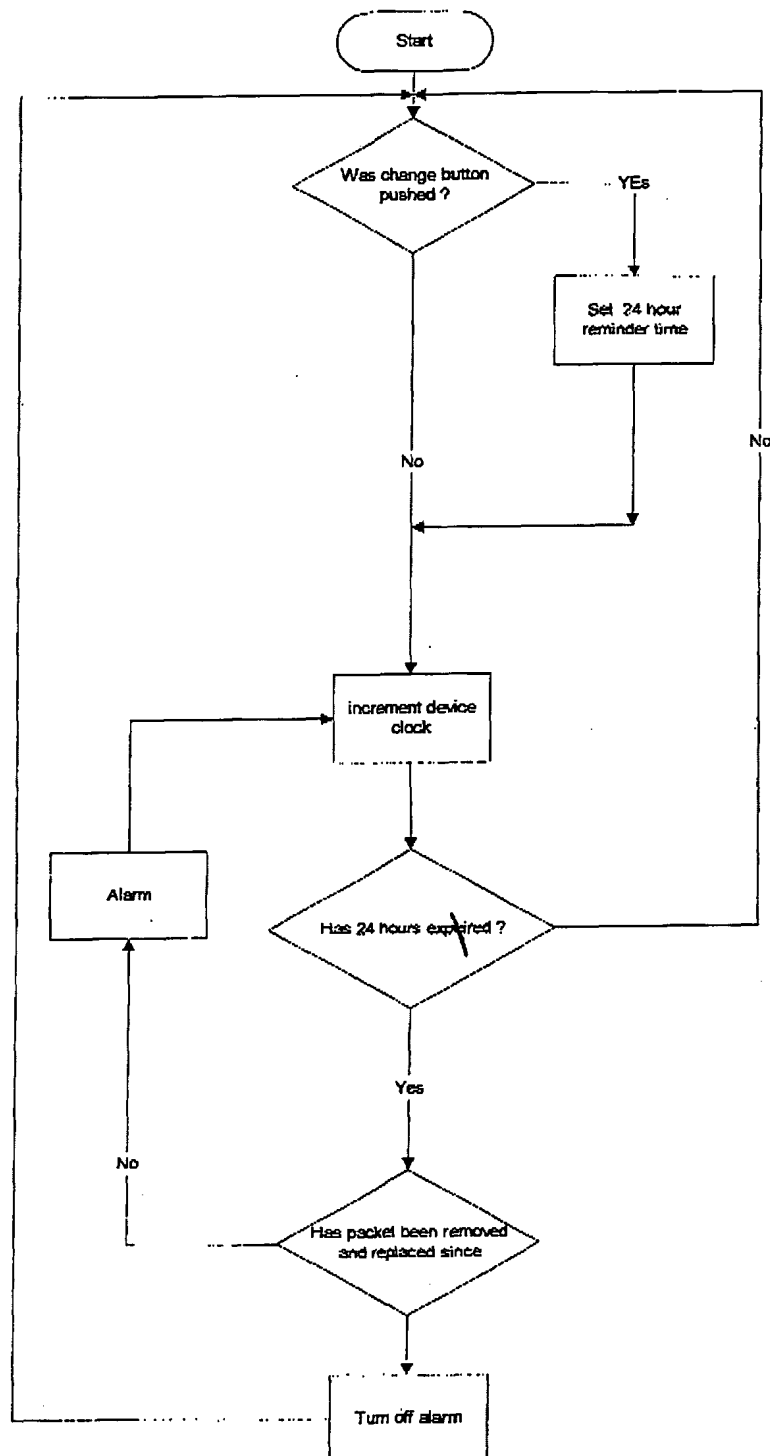


Figure 7

INTERNATIONAL SEARCH REPORT

 International application No.
PCT/AU03/00290

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ : A61J 7/04		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) Refer electronic databases consulted below		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DWPI +keywords: tablet, dispense, alarm and similar terms		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 611 671 A1 (MEURISSE) 9 September 1988 Page 4 lines 33 to 37 and page 5 lines 28 to 34	1-15
X	NL 7808415 (VENTURE B V) 13 February 1980 Figures 1 and 2	1-6, 9-15
X	DE 4028068 A1 (WILHELM STOERK TEMPERATUR MESS) 12 March 1992 Figure 1	1-6, 9-15
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 8 May 2003		Date of mailing of the international search report 26 MAY 2003
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929		Authorized officer SUE THOMAS Telephone No : (02) 6283 2454

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU03/00290

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,419,016 (ZOLTAN) 6 December 1983 Abstract	
A	WO 95/09386 A1 (APREX CORPORATION) 6 April 1995 Abstract	
A	US 5,915,558 (GIRVETZ) 29 June 1999 Abstract	
A	US 4,526,474 (SIMON) 2 July 1985 Abstract	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU03/00290

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
NL	7808415/78	NONE					
DE	4028068	NONE					
US	4419016	DK	3065/83	EP	101812	GB	2123585
		JP	59025749	NO	832358		
WO	9509386	AU	80735/94	CA	2172981	EP	721610
US	5915558	NONE					
FR	2611671	NONE					
US	4526474	EP	129785	HK	108/90	DE	3335301
END OF ANNEX							